

**Amphenol**  
MILITARY & AEROSPACE



**Interconnect Solutions for Missile Systems**

[www.amphenolmao.com](http://www.amphenolmao.com)

## AMPHENOL

is one of the largest manufacturers of interconnect products in the world. The Company designs, manufactures and markets electrical, electronic and fiber optic connectors, coaxial and flat-ribbon cable, and interconnect systems. Amphenol has long been the accepted leader in providing quality connectors and interconnect systems to the Military and Aerospace markets.

# Missile Systems market

**Throughout our long history we have been consistently recognized as offering the broadest range of interconnect products to the most demanding customers of the Military Aviation market.**

Amphenol thinks globally but acts locally when it comes to customer support. Our global presence allows us to take full advantage of our numerous corporate resources and our products portfolio includes qualification to all major military and many unique customer specifications (GRAMS...). Amphenol has over 80 years of experience in the Military and Aerospace market and have always led the way. As an example, the well-known Mil-DTL-38999 / EN3645 cylindrical connectors have been designed by Amphenol's Engineers. In the early 1990's, Amphenol was the first to market the composite versions of the MIL-DTL-38999 Series III CTV connectors as well as the composite modular rectangular EN4165 SIM connectors, to meet the customer requirements in terms of weight saving.

Today, Amphenol paves the way with high reliability smart interconnect such as high speed cable assemblies, Flex, Flex-rigid or 1750 distribution modules, in order to optimize cabling space and weight – as well as cost.

From the board level to the outdoor interconnect, Amphenol provides a full range of design services required to support the customer's applications design and modelling, applications engineering, fabrication, value-added assembly, and testing.

Coupled with the largest interconnect offering on the market, Amphenol supports all of your system-level need.

Amphenol is now the leading manufacturer of integrated system solutions for the missile systems market, and is dedicated to working with its customers in an engineer-to-engineer effort, focused on system development.

How can we help ?



# TECHNOLOGIES

Technology and innovation are in our DNA. Building on our technologies, we support our customers with any specific requirement they may need : from minor adaptations to derivatives and from standard to completely new interconnect solutions. Tell us what your requirements are and let us figure out a solution for you.

## SWaP

### Size, Weight, and Power (SWaP):

Amphenol has more interconnect options to reduce size and weight, while maintaining needed power requirements, than any other manufacturer. From system attachments to complex assemblies, Amphenol Military & Aerospace has led the industry in the use of lightweight materials, high contact density design, and unique packaging without sacrificing power and performance.



### Ruggedization:

Amphenol has the broadest range of ruggedized, harsh environment interconnect solutions in the industry. For over 60 years, Amphenol Military & Aerospace has led the military and aerospace industries with countless designs that withstand high altitude and temperature ranges, shock, vibration, humidity, and the harshest sealing requirements.



### High-Speed:

Amphenol designs and builds custom connector and cable solutions for High Speed Copper, Fiber Optic, and Integrated applications. Amphenol Military & Aerospace has numerous interconnect options to solve any high-speed data transmission needs from 10 Gb/s and beyond, while incorporating solutions for all high-speed protocols and media conversion.



### RF Transmission:

Amphenol designs and manufactures standard and custom RF/Microwave coaxial connectors, cable assemblies and passive components designed for military, satellite, aerospace, and commercial applications. Amphenol Military & Aerospace has the most extensive RF connector Mil-Spec product offering of any supplier, including adapters, attenuators, and terminations.



### EMI and EMP Protection:

Amphenol's EMI & EMP Protection solutions offer the versatility of standard connectors with EMI/EMP protection for sensitive circuits. Internal housing of the EMI/EMP devices eliminates costly and bulky exterior discrete protection devices. Virtually all circular and rectangular connectors can be incorporated with filter devices.



### Electronics Packaging:

At Amphenol, we understand that high reliability electronics requires state-of-the-art equipment, experienced and passionate people, and rigorous process validation. Amphenol Military & Aerospace's expertise in electronics design, design-for-manufacturer, assembly, and test is second-to-none in the industry.



# PRODUCT FOCUS

## 1 SEEKER

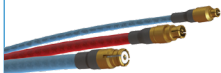


### PCB, BACKPLANE, FLEX & FLEX-RIGID

- Design & Engineering Services
- Assembly, Testing & Engineering Services
- Hybrid constructions
- High frequency, High temperature
- Turnkey solution featuring any type of connectors

### RF & MICROWAVE Connector & Cable

- Broadest range of high reliability and high performance military and space graded RF / Microwave connectors : BMA, SMA, 2.92 mm, 2.4 mm, 1.85 mm, SMP, SMPM, SMPs, TNC, PTNC, Type N, PN
- COTS and custom solutions, including hermetics
- All cable options available, including flexible and semi rigid



### MIL-DTL-38999 Connector

- Rugged, standard I/O connector
- Coax, Twinax, Quadrx and Octonet contacts available to match high speed requirements
- High density layouts for miniaturized version
- Standoff versions to relieve mechanical stress on PCB
- Available with crimp, solder or press-fit contacts



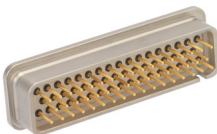
### µCOM Connector

- Miniature 10 Gb + Ethernet connector /Cat6A
- Outer shell maximum diameter 15 mm (.59")
- MIL-DTL-38999 series III environmental resistance
- Solder and crimp contacts
- Threaded coupling mechanism or Push-pull version on same receptacle



### High Density Hermetic Connector

- Custom design to specs for cooled infrared seekers
- High density pin count (to 0.050" pitch)
- Hermetic sealing and High pressure capability
- High conductivity and low resistivity for high data rates
- MIL-DTL 83513, 82723, 24308 standards or custom
- Custom fits for critical, high performance system applications
- Wide operating temperature range (typically -40 to +170°C)



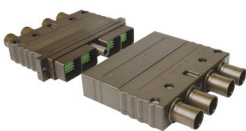
### MICRO-D Connector & Cable

- Meet or exceed MIL-DTL-83513 requirements
- Surface Mount / Straddle Mount / Panel Mount
- Solder and non-removable contacts
- High temperature and hermetics available
- Combo / Hybrid and custom Micro-D
- Custom Cable-Harnesses Assemblies



### EN 4165 / SIM Modular Connector

- Inserts in overmold Technology for excellent sealing and electrical performances
- Versatility of mixing & matching Signal, Power, Fiber Optics, RJ45 cat6 and RF (Quadrx, Triax, Twinax and Coax)
- Available in standard Mono, 2 & 4 bay, or custom configurations
- EN4165 specification is comparable to U.S. MIL-STD-810 in performance

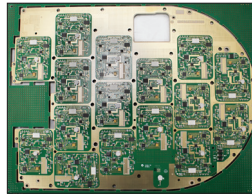


### 1750 Distribution Modules

- Junction modules for signal and low current distribution
- Suited for wiring optimization (cable linear meters : weight, space and cost saving)
- Very compact design and high contact density
- Versatility of mixing on metallic or composite tracks
- Overmold Technology offering excellent sealing performances



## 2 WEAPON CONTROLLER

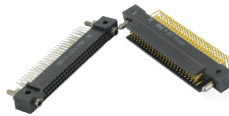


### PCB, BACKPLANE, FLEX & FLEX-RIGID

- Design & Engineering Services
- Assembly, Testing & Engineering Services
- Large panel sizes & Large form factor panels with utilization up to 24x54 panels
- High layer count backplanes, up to 60+ layers
- High Density Interconnect : copper filled microvias structures staggered or stacked across multiple layers

### HDAS Board Level Connector

- Dedicated to high temperature and vibration levels
- Meets or exceeds all MIL-DTL-55302 requirements
- .075" X .075" staggered grid pattern
- 36 unique keying combinations
- 4,5 A per signal contact & DWV : 750 Vrms



### HDB3 / HSB3 Board Level Connector

- B3 brush contact providing 100,000 mating cycles, low mating forces, intermittency-free performance
- .070" X .060" staggered grid pattern
- 36 unique keying combinations
- HSB3 data rates up to 6.25 Gbps



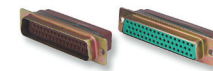
### R-VPX Board Level Connector

- Compliant to VITA 46 for Open VPX applications
- Exceeds VITA 47 and 72 performance requirements
- Modular COTS lightweight connector system
- Can be combined with high power modules, RF modules (VITA 67) and Optical modules (VITA 66)
- Capable of data rates in excess of 10 Gbps



### D SUB Connector

- Meets or exceeds MIL-DTL-24308 requirements
- Subminiature rack & panel type
- Polarized shell
- High density layouts
- Filtered option
- Custom designs on request



## 3 RAKE

### FLEX & FLEX-RIGID Assembly

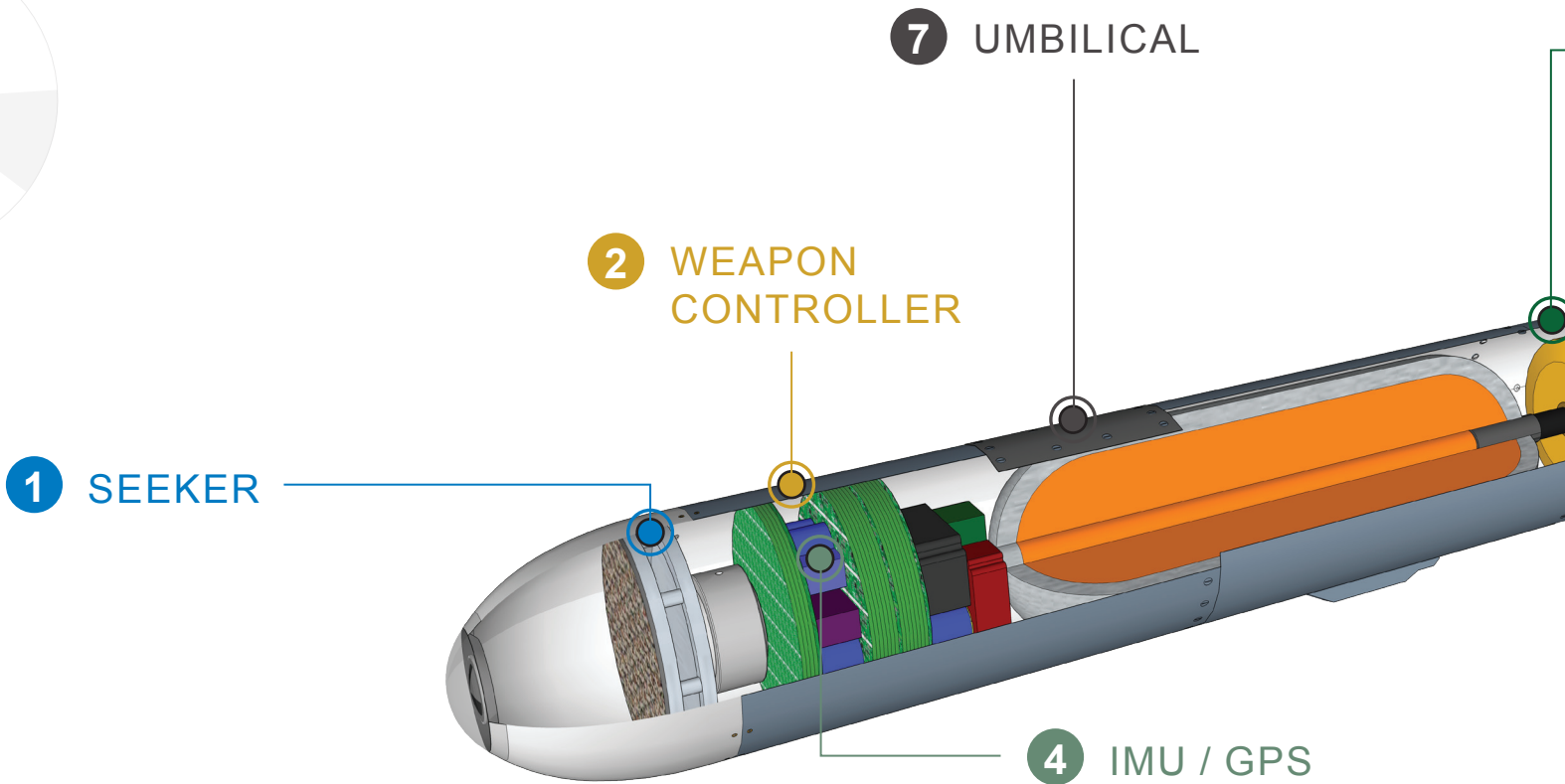
- Substantial mass savings (up to 70%) compared to an equivalent discreet wire harness
- Excellent signal integrity and electrical performance with low cross-talk, multiple shielding options and impedance control - Capable of supporting a multitude of current and power requirements
- Quick turn capability from prototype to production



### Electrical Harnesses


- 3D Harness Design for Installation
- Electrical schematics, Wiring List & BOM
- Wiring operations and inspections
- On site installation & support
- Technological capabilities include : Clean Room (5000 ppm), Fiber Optic Wiring, Aluminum Cable Termination, Flex Cable Manufacturing & Assembly





## 4 IMU / GPS





**HD 38999 High Density Connector**

- Derived from MIL-DTL-38999, featuring MIL-DTL-38999 components except for the insert which goes from 9 to 187 contacts
- 30% more contact density than the highest density MIL-DTL-38999 connector of its size
- Mil-qualified AS39029 size 23 contacts
- Available as filtered, hermetic and custom version


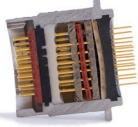
**MIL-DTL-38999 Size 7 High Speed**

- Derived from MIL-DTL-38999, match the performances of connector type 38999 III in terms of Shocks and vibrations, EMI shielding, Temperature, Electrical performances
- Size 8 grounded cavity for standard quadrax contact from MIL-DTL-38999 series III
- Integrated backshell

**MIL-DTL-38999 Reduced Flange**

- Derived from MIL-DTL-38999 series III, featuring the same inserts and mating with standard plugs
- Available in crimp, PC Tail, Stand Off versions
- 37% average footprint reduction surface reduction
- 36% average reduction of panel/PCB distance on stand-off version
- 30% lighter than average 38999 stand off receptacle

## 5 SAU / FUSE

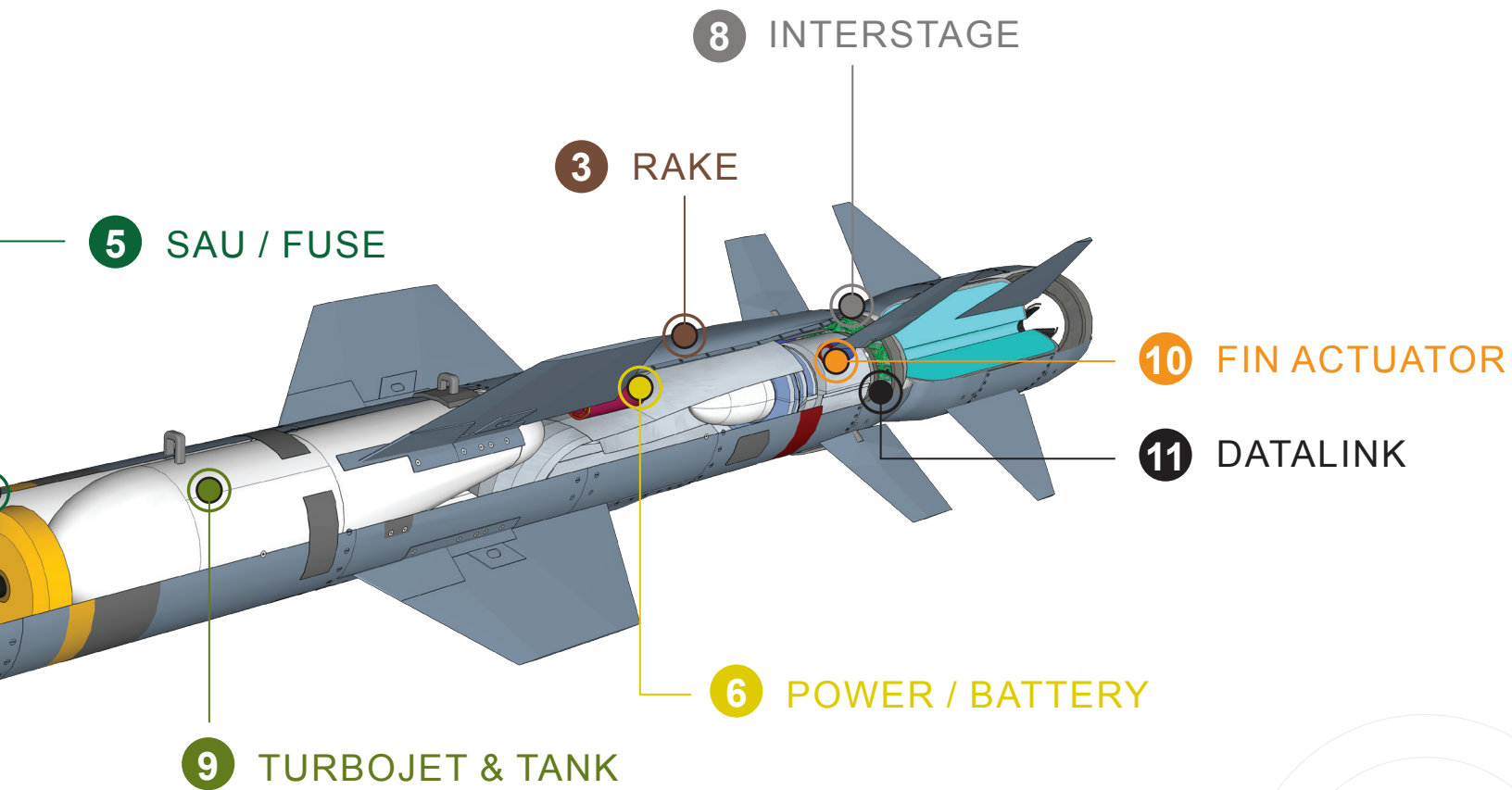
**Custom Hermetic Connector**

- Standard or custom design for ignition device, safety arming unit and fuse
- Comply with military & industrial specific standards (e.g: Mil-DTL, 5015, 26482, 38999, 81513, 82723 & 24308) - circular & rectangular connectors available
- Corrosion resistance for long lasting performance
- Many options available, including special flanges, PCB mounting tails, stand-offs, EMI filtering, through bulkhead...

**EMI/EMP Filter Protection Connector**

- Amphenol® EMI/EMP Protection Connectors offer the versatility of all major MIL-Spec circular standard connectors with EMI/EMP protection
- Filtering options include : High Speed Filter Connectors, Filter Plug Connectors, Filter Adapters, Header Assemblies, Diode Connectors, MOV Connectors, Energy Shunting Assembly (ESA) Connectors





## 6 POWER / BATTERY



### Glass-to-Metal Seals

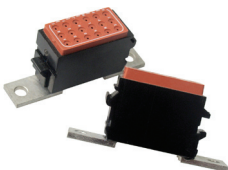
- Custom designed solutions with advanced sealing techniques and plating
- Standard product range or custom embedded concepts including : Wide Material Selection, Pressure differential up to 60,000 psi, Fire wall capabilities to 1000 °C, Matched or Compression Seals, selective plating...

### MIL-DTL-12883 Relay socket

- Relay Sockets are manufactured to MIL-PRF-12883 specifications, plus specialized requirements
- Sockets available with fixed or loose mounting studs
- Designed for standard MIL-C-39029 contacts
- Product line includes Low Profile, Extended Height, Micro Miniature, Board Mount, Track Mount and Solder Termination relay sockets options

### 1758 grounded distribution modules

- Distribution modules for grounding applications
- Suited for wiring optimization (cable linear meters : weight, space and cost saving)
- Very compact design and high contact density
- 2 versions : Individual mounting brackets or mounted on metallic tracks
- Overmold Technology offering excellent sealing performances



## 7 UMBILICAL



### Fail Safe Lanyard/MIL-DTL-1760 Type I

- Standardized Missile-Aircraft or Bomb-Aircraft interconnection MIL-DTL-1760 Type I
- Quick-Disconnect with an Axial Pull of Lanyard
- Completely intermateable with standard MIL-DTL-38999 receptacles
- Tri-Start Breakaway Fail Safe connector exceeds the MIL-Spec Series III requirements for EMI/EMP shielding



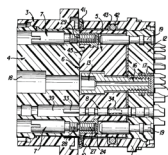
### MIL-DTL-83538/MIL-DTL-1760 Type II

- Standardized Missile-Aircraft interconnection
- Full suite of products available ASI, MSI, Buffers
- Low profile receptacles available
- Custom designs for better integration and lower profile on request
- Accessories : adapters, overmoulded, caps...



### MIL-DTL-38999 SC39 Lanyard

- Quick Release Connectors derived from MIL-DTL-38999 series III, featuring the same inserts
- 100% scoop-proof shell
- Grounding spring on the shell
- Available as Lanyard, Stand-Off, Low Profile, Integrated backshells and Reduced Flange



### Parallel launch, Vertical shear & Custom

- Based on an extensive product range, Amphenol have developed many custom solutions to ensure a safe and reliable disconnect between the missile and its launcher - aircraft, tube, canister, turrets... - while focusing on an always lower profile receptacle
- These custom designs include among other : glide connectors (parallel launch) & shear connectors

## 8 INTERSTAGE

### MIL-DTL-38999 RNJ Connector

- Rack and panel connectors derived from LJT MIL-DTL-38999 series I, featuring the same inserts
- Used to connect electrical and optical devices between a moving unit (rack) and a fixed unit (panel) without any coupling / uncoupling device
- EMI shielding
- Moisture resistance

### SIM Modular Custom Connector

- Designed and qualified to EN 4165 European military aerospace standards
- Modular, multi-functional rectangular connector featuring EN 4165 modules - including power, RF, Fiber Optic, Coax, Twinax, Triax, Quadrax, end pins
- Scoop-proof and blind mating shells available
- Custom designs on request

### MIL-DTL-38999 Connector

- Rugged, standard I/O connector
- MIL-DTL-38999 Series I (LJT) & II (JT) & III (TV)
- Largest choice of Power, Signal, High Speed, Fiber Optic and mixed layouts available
- SJT Combine scoop-proof LJT series design within standard mounting dimensions of JT types

### MIL-DTL-83723 / EN 2997 Connector

- MIL-DTL-83723 Pyle series III high temperature styles are capable of operation at 260 °C
- Meets Boeing BACC63CM/CN Firewall, European ASD EN 2997, Roils Royce/SBAC ESC10 and ESC11, General Electric M50TF3564 requirements
- 100% scoop-proof version available
- Through bulkhead available

### Clamps & System Attachments

- Overmold Technology
- Full composite and silicone to save weight vs. metallic clamps
- 8 Sizes available for cable diameter from 5 to 48 mm
- Fire/Smoke/Toxicity conform to ABD 031 and FAR 25853

## 10 FIN ACTUATOR

### MICRO LATCH Connector

- Rectangular connectors for tool less fast latching
- Small package size - flangeless option available
- Sealed
- Removable contacts
- Programmable keying to prevent mis-matching
- Quick disconnect, visible latching

### PEGASUS & NANO PEGASUS

- COTS lightweight connector system
- Polyetherimide single piece housing available with Nickel / Copper plating for EMI shielding
- Down to 28 AWG wire barrel, 7.5 grams per mated pair and a density up to 132 contacts per sq inch
- Cost effective and lightweight alternative to micro D

### 2M Connector

- Micro-Miniature complete series 2M801, 2M803, 2M804, 2M805 - over 90,000 P/N available
- Mass and volume saving alternative to conventional MIL-DTL-38999 series
- Full suite of options available OTS : stand-off, platings, terminations, high-speed, filtered, hermetic and accessories, backshells, heat shrink boots, caps...

## 11 DATALINK

### RIGID PWB Advanced Material and RF

- Proper laminate selection enables high speed routing up to 56GHz
- Lower Dk/Df laminates allow routing of wider traces on thinner dielectrics, higher layer count without increasing overall thickness, lower impedance tolerances sequential lamination and Hi-Temp assembly

### FLEX Assembly

- Design & Engineering Services
- Assembly, Testing & Engineering Services
- Hybrid constructions
- High frequency, High temperature
- Turnkey solution featuring any type of connectors

### MICRO-D Connector

- Meet or exceed MIL-DTL-83513 requirements
- Contact styles : signal, power, RF, Fiber Optic
- Solder and non-removable contacts
- High temperature and hermetics available
- Combo / Hybrid and custom Micro-D
- Double or Multiple-Bay (vertical/horizontal)

### MMA Connector

- Compact blind mate connectors featuring two ARINC 600 modules - including power, RF, Fiber Optic, Coax, Twinax, Triax, Quadrax, shrouded size 22 pins
- Low mating forces
- Filtered option
- Custom designs on request

### High Speed Copper Connector

- Quadrax, Split-Pair Quadrax & Differential Twinax Contacts for MIL-DTL-38999 Series III Size 8 cavity
- Coaxial, Twinax, Triax Contacts for MIL-DTL-38999 Series III Size 8, 12 and 16 cavities
- Matched Impedance Coaxial Contacts, Size 12
- Oval Contact System (OCS) Connectors

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